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Forestry in Pennsylvania.

IT is two years since the Legislature of Pennsylvania passed an act creating a forest commission charged with the duty of making a survey of the state, and to collect facts as a basis for intelligent legislation. We have had occasion to allude more than once to the satisfactory way in which the work of this commission was progressing, and we have borne witness to the fact that Professor Rothrock's illustrated lectures were doing much to enlighten public sentiment in other states as well as in Pennsylvania. We are not aware that the commission has yet made a final report embodying outlines of all the forest-laws considered necessary, but we have received copies of two bills which are to be introduced in the next Legislature, and which, it is to be hoped, representatives of that state will promptly enact as forward steps toward an enlightened forest-policy.

The first of these bills provides for the establishment of three separate forest-reservations within certain counties named, each of which shall contain no less than 40,000 acres of land in a continuous area. It also provides that at least half of the lands chosen for these reservations shall have a minimum altitude of eight hundred feet above sea-level, and that all of the land shall be of a character better suited to the growth of trees than to mining or agriculture. The Forest Commission is to select these lands, and is authorized to purchase them at prices not exceeding two dollars an acre where this can be directly accomplished, and where this is not possible, full power is given to condemn such lands as reservations for the use and behoof of the commonwealth, subject to such conditions as the legally constituted authorities may impose. It is further provided that the State Geological Survey shall examine the land so acquired and make a report, with accompanying maps and illustrations, upon their value as water-sheds and reservoirs; and that the State Board of Health, the State Board of Agriculture and the Fisheries Commission shall each report every year upon the uses and value of these reservations in relation to the several subjects within their jurisdiction. There is no doubt that these reservations could be made larger to the advantage of the state, but it seems to us the part of wisdom to begin moderately as the framers of this bill have done. The subject is one of growing interest, and if the land thus acquired is administered properly, it will certainly create a demand for more, and this demand can be met as public sentiment gathers volume and force.

The second bill which we have received provides ways and means for educating the people by illustrated lectures on forestry and economic zoölogy. But, while the state is in this mood for reform, it is hardly probable that the Legislature will neglect to make some special enactment for the prevention of forest-fires, which have been so destructive in that state. No efficient guard can be set over the forests without money. Men who can be trusted to serve the state in this direction must be paid just as firemen must be paid for their services in cities. As the case now stands, the great burden of extinguishing fires, when they are extinguished, falls upon the poorest counties, while every part of the state is quite as much interested in the suppression of these fires as these mountain regions. The obligations in this particular ought to be equalized in some way. The State Grange has lately passed some strong resolutions on forest-fires and in favor of the reservation scheme, and their preamble sets forth the facts that floods of increasing severity, due to the removal of large bodies of timber from the high-water sheds of the state, are yearly sweeping away bridges and fences, destroying roads, washing away the soil and covering fertile lands with gravel, and they argue that the time has come for the state to help protect the sources of water-supply from forest-fires and forest-destruction of every sort.

Since much of the agitation in favor of national forestry can be traced to the zealous labors of the commission, it would seem to be the part of reason to make this body permanent—an established element in the administration of the state, and as regularly provided for by legislative appropriation as any other branch of the Government. Certainly the forest interests of Pennsylvania are of sufficient magnitude to deserve such recognition. It may be a question whether the Forest Commission ought to be subordinated to the State Board of Agriculture, or should have an independent position of its own; but, in any event, there is no doubt that this great state ought not to delay the establishment of some permanent body whose constant duty it shall be to look after the interests of its forests.

Destroying Weeds by Act of Congress.

MORE than fifty years ago some of the political farmers of New York state were thrown into a panic on account of an invasion of the Canada Thistle, and it was publicly predicted that this weed would "establish its fatal empire over the whole of North America." Experience has proved that the Canada Thistle is a bad weed, but there are limitations of climate which check its predicted triumph over the continent, and, like other weeds, its progress is always arrested by a barrier of good farms; that is, where the best crops are produced weeds never gain a foothold, and never have a chance to grow. This law is universal. Weeds do little injury to good farms, and, on the contrary, good farming exterminates weeds. This fundamental truth should be taken into consideration whenever the country becomes agitated over some new weed, and although the Russian Thistle is not likely again to frighten Congress from its propriety, other foreign weeds will doubtless make forays into our unoccupied lands in times to come, and we ought to be prepared for them beforehand.

The conquering progress of the so-called Russian Thistle and the bill before Congress to appropriate a million dollars for the relief of the people whose homes and fortunes were said to be threatened by it, furnished the text for a paper before one of the sections of the American Association for the Advancement of Science last summer, which we hope may be published in some of the journals devoted to

political science. Professor Bailey read this paper, which showed, in the first place, why this weed has spread with such virulent rapidity. The reason is simply that weeds, like other plants, grow where they can find room, or rather can find conditions of competition into which they can enter prosperously. They may grow in land that is already occupied, just as climbing plants will flourish in dense thickets of shrubbery, or pumpkins grow in a corn-field. What is needed to exclude weeds is not only occupation by other vegetation, but a rotation in which the weeds which come in with one crop may be destroyed by the cultivation of the next. This simply means that the conditions of successful agriculture are those against which weeds can never prevail. The Daisies have not ruined the good meadows in the east, but they usurp control of soil which has been already exhausted and where the grass is not properly encouraged in the struggle. It is along roadsides and in neglected fields that Canada Thistles flourish. In the untilled plains of Dakota or over the leagues of tilled land where wheat follows wheat, yielding in endless succession year after year eight or nine bushels to the acre, the conditions are just such as invite such a sturdy intruder as this Russian weed. There are more weeds in the west than in the east because there is more waste ground.

New countries always suffer more from weeds than old ones do, because the felling of the woods and the breaking up of the prairies disturb the equilibrium of things, and every plant begins to make a fight to occupy and possess the land. Agriculture in these recently settled regions is usually one-sided, and this makes an easier conquest for the invading army. The Russian Thistle will never get any dangerous lodgment in a well-tilled farm, and where it now exists proper agricultural practice will quickly subdue it. Indeed, the only way to subdue any weed is to keep profitable crops growing. Taking this view of the case, what sort of a warfare could the Government wage against this Russian Thistle with a million dollars? If it should hire men to pull up and burn every weed they found there would be some seed left, and in a year or two the crop would be as abundant as ever. The only way to rout the weeds is to revolutionize the prevailing agriculture, and since Government is not conducting the farms of the west it is hard to see how the owners of these lands can be compelled to practice a rotation of crops that would secure them from evil. The fact is, that this trouble, like the plague of rabbits in Australia and the cardoons on the pampas, is one of those evils which always come to a new country where established conditions are overturned. It comes to remind settlers of the weak points in their agricultural systems, and although the lesson is pretty painful in the outset, it will, perhaps, for this reason be remembered longer. But, after all, the settlers in new countries take these chances, and they must help themselves. No doubt, Government can do something in the way of instructing farmers how to improve their farm methods, but, in the terse words with which Professor Bailey concluded his paper, "Weeds are beyond the reach of the sheriff; laws cannot control a vacancy in nature."

The Hardy Catalpa in the West.

In the earlier days of tree-planting on the prairies the hardy Catalpa, C. speciosa, was recommended without reserve for the entire region beyond the Mississippi River south of the latitude of Minneapolis, but experience has proved it to be of more limited adaptability, and its range of satisfactory growth is about the second or third tier of counties from the southern line of Iowa and Nebraska. It can resist neither cold nor drought, hence it is not worth planting west of the ninety-ninth parallel. Within its range, however, it is a tree of peculiar value to the western planter. In south-eastern Kansas, at Farlington, there is a plantation of over five hundred acres, most of which is Catalpa, which was set between 1878 and 1882. The trees were planted four feet apart each way, and now average about twenty-eight feet high, with trunks four inches in diameter at three feet from the ground. This is a pure growth, and it illustrates some of the peculiarities of this tree. Unlike Black Walnut grown in close mixed plantation, and Wild Cherry, Catalpa does not clean itself well; the small lateral branches are very persistent. In October, while going through the Farlington plantation, I observed that these dead branches were very difficult to break off, and they will probably adhere to the tree at least two years longer. The trunks are straight and tall, as grown at Farlington, but these dead lateral branches, clothing the boles of the trees almost to the ground, are sure to make knots or faults in the timber. The Catalpa is a light-demanding species, and it leaves out late in the spring and drops its foliage at the first frost, so that even when planted only four feet apart there is quite a weed-growth beneath the crown. It is very dense-foliaged in midsummer, but the grass and weeds get a hold before the trees are in full leaf; hence the Catalpa is not a soil-improver, and should always be planted with some shade-enduring species. I am not aware of its having been tried, but I should think the Russian Mulberry a good tree to alternate with Catalpa; if additional kinds were desired, a good mixture would be one-fourth Mulberry, one-fourth Catalpa, one-fourth Wild Cherry, one-eighth Black Locust, one-sixteenth Burr, or White Oak, one-sixteenth Black Walnut.

At the Kansas Agricultural College the Catalpa has been used as a nurse-tree for Oaks, but it is not satisfactory; it not only fails to keep down weed-growth, but at seven years from planting the Oaks are completely overtopped by the Catalpas.

At the State Forest Experiment Station, Ogallah, Kansas, in longitude ninety-nine degrees, forty minutes west, latitude thirty-nine degrees north, the Catalpa grows very poorly, the climate evidently being too dry for it. At Des Moines, Iowa, it kills back quite badly in severe winters, but there are good-sized trees in several lawns.

The Catalpa was given a thorough trial at the South Dakota Agricultural College, but it proved altogether too tender for that locality.

In the Farlington plantation, Catalpa Catalpa occupies several acres, but it cannot compare with the hardy Catalpa as a timber-tree; it has a sprawling habit and is not forced into tall growth when planted four by four feet.

Washington. *Charles A. Keffer.*

Foreign Correspondence.

London Letter.

Judging Plants was the subject of an interesting and timely lecture, last week, by Mr. James Douglas, one of the very best all-round gardeners in England, and, perhaps, the most experienced of judges at flower-shows. To judge collections of garden produce, whether it be plants or flowers or fruit or vegetables, and to award the prizes satisfactorily one must know a great deal not only about the capabilities of the plants, but what art and skill are necessary in their production, and even then he is apt to make awards which will be unpopular unless his sympathies are in line with the aims of the growers. I have known capable judges who have been severely criticised for giving most points to size when form was considered of first importance, or to color when size ought to have had first place. Then it is so easy to make a mistake by calling something a fruit which the exhibitors call and show as a vegetable, or a plant herbaceous when it is popularly, although not strictly properly, excluded from that class. For instance, it is not permitted to show Lilies or Hyacinths or Tulips in a collection of herbaceous plants. Old hands know the limitations well enough, and do not lose points through mistakes which the beginner among competitors can easily make. As Mr.

Douglas says, although the real value of fruit is in flavor, yet, as a rule, at exhibitions size and color only are considered. The same applies to vegetables; the big potatoes, cauliflowers and cucumbers, which only a cow would eat with any pleasure, almost invariably count first at exhibitions. It is quite time that an effort should be made to reform this kind of thing, as horticulture really loses rather than gains when characters of no real value are allowed to count for a great deal at exhibitions. Mr. Douglas recommended that more care should be taken in defining the character of the classes in the preparation of the schedule, as judges ought properly to interpret the schedule literally, whatever the consequences. But, so far, very little care has been exercised in the preparation of the schedule, and the result is, in consequence, more or less squabbling between exhibitors, the committee and the judges. Mr. Douglas's suggestion has been taken up by the Royal Horticultural Society, who have appointed a committee to draw up a code, or guide, to judging which shall be explicit and cover all questions likely to arise at exhibitions of horticultural produce. If well done, and there is no reason why it should not be, this code will be to horticulturists what the Marylebone Cricket Club rules are to all cricketers—the guide and arbitrator upon whose dicta all are content to rely.

VEGETABLE PATHOLOGY.—A large treatise on the diseases of trees, originally prepared by Professor Hartig, of Germany, and now translated by Dr. Somerville and revised and edited by Professor Marshall Ward, has recently been published by Macmillan & Co., and favorably noticed in the English press. [This work has been reviewed in GARDEN AND FOREST, page 488.—ED.] It is essentially a diagnosis of diseases among trees, and does not prescribe cures for them. The easy guide to a knowledge of plant-diseases and how to prevent or cure them has yet to be written. For instance, I cannot get any one to tell me exactly the nature and cause of spot in Orchids and how to prevent or cure it; the cause of and cure for canker in fruit-trees; to explain the sudden death of Heaths or other hard-wooded plants which sometimes die wholesale as if stricken by the plague. There is much learning in such treatises as this last addition to the English literature of plant-diseases, but practical people can get little out of it. First catch your hare is a good proverb, and first know the nature of the disease before attempting a cure is likewise sound advice. If some one would collect, condense and simplify all that has been written and is reliable upon the diseases of plants, cultivators would be grateful. Even such subjects as Potato-disease and Corn-smut are not yet worked out so as to be clear to the laity, some of whom declare that while scientific men have, as a rule, limited themselves to tracing the life-history of the disease and deciding what it should be called, practical men have seen that a weak constitution falls an easy prey to a disease which a strong constitution can resist, and have accordingly bred for strength and found salvation. Breeding, however, is not a ready alleviator in the case of diseased trees. Still we are apt to go on struggling with a hopeless cripple when it would be far simpler and easier to burn it and replace it with a healthy youngster. There is much ignorance apparent in the ordinary treatment of trees and shrubs, which often fall an easy prey to some fungal or other disease through neglect of ordinary precautions. By the way, I notice that you do not recommend coal-tar for the dressing of wounds in trees and shrubs. At Kew nothing else is used, and it answers perfectly in all cases. [Coal-tar makes one of the best of coverings for the wounds of trees, and we have often commended it.—ED.]

There are innumerable "quack" remedies and cures for plant-diseases, which are often recommended by those who ought to know better. For instance, a recently published work on horticulture contains a chapter by a specialist on Fruit-culture, who gravely recommends "driving rusty nails into the trunks of fruit-trees as a preventive or cure for blight"! Clearly, therefore, we want some authoritative guide to plant-ailments and their cure. The following shows that this want is also felt by Continental cultivators:

Vegetable pathology is receiving considerable attention from Continental botanists, and for the purpose of giving the necessary information for the cure and prevention of plant-diseases, a special committee has been established by the Royal Botanical Society of Belgium. This body will meet at the Brussels Botanic Gardens, where nurserymen, horticulturists, arboriculturists, etc., may obtain all the advice science can give on the subject.

ARTIFICIAL MANURE FOR ALPINE PLANTS.—An eminent chemist, Professor Hugo Muller, who is also an enthusiastic collector and grower of alpine plants in the south of England, has concocted a mixture which he applies to all his rock-plants, with, he says, beneficial results. The mixture is composed as follows:

40 gallons of water (in paraffin cask).
2½ oz. Potassium phosphate.
1½ oz. Potassium nitrate (nitre).
1½ oz. Magnesium sulphate (Epsom salts).
1½ oz. Calcium nitrate.

The Calcium nitrate is prepared by taking 100 ounces or less of chalk, dissolve it in dilute nitric acid until it ceases to give off carbonic acid. This leaves a solution of one and a half ounces of Calcium nitrate for each ounce of chalk.

This is mixed in the paraffin cask and the plants are watered with it about once a fortnight during the growing season. Professor Muller is a gardener as well as a chemist, and, therefore, a safe adviser in a matter of this kind.

THE GLASTONBURY THORN.—The mild weather we have had lately has induced this Thorn to flower with exceptional vigor and a little in advance of the usual time. I have seen specimens from Bath and several other places in the south of England, bearing abundance of new leaves and flowers, as well as the ripe fruit. The fruit is said to be from the second or spring lot of flowers. It is the Cratægus oxyacantha, var. præcox, of Loudon, and is an interesting plant apart altogether from the legend with regard to its origin, which is that Joseph of Arimathæa visited Glastonbury, in Somerset, to preach the gospel, and after toiling up a hill, now known as Weary-all-hill, he stuck his staff into the ground and went to sleep. When he awoke his stick had taken root, and eventually it grew into a tree, which always blossomed on Christmas-day. Glastonbury Abbey was built near the spot where this tree stood. Loudon says there is no reason why Joseph's stick should not have been the origin of the Glastonbury Thorn, and its habit of flowering in midwinter is nothing very extraordinary, seeing that Chestnuts, Apples, Pears and other trees will flower in late autumn if the season be favorable. The mild weather here this year has affected many plants; for instance, Jasminum nudiflorum has been in bloom a month or more, Chimonanthus also, while Abutilon vexillarium, on a south wall, is still in full bloom. The Glastonbury Thorn opened its first flowers at Bath this year on November 17th, but usually they expand about a fortnight before Christmas.

London. *W. Watson.*

I do not dislike garden-walls; it is sometimes a good and consoling thought to reflect that one is in a well-secured enclosure, alone with perfumes, flowers, trees, the air, the sun, the stars, remembrances and reveries, and to know that nobody can come and disturb you. I like walls, but I do not like white walls. I like nothing but old walls. I have one here which pleases me much. It is just as old as it ought to be; if it were a little older it would be given over to the mercy of bricklayers, who would introduce all sorts of new bricks and white stones. As it is, it is gray and black and diversified with the subdued tints of twenty species of Mosses and Lichens. It is crowned with yellow Wallflowers and Ferns, which root in the crevices on its summit, and its base is buttressed by Pellitory and Nettle in masses of richest green.

—ALPHONSE KARR, in *A Tour Round my Garden.*

A lawn amid extended wood affords the same relief as a mass of wood on a wide expanse of meadow.

—*Planting and Rural Ornament*, 1796.

New or Little-known Plants.

Quercus Texana.

STUDENTS of our trees have long been puzzled by a black Oak of the Mississippi valley with leaves like those of the Scarlet Oak or of the Pin Oak in outline, and fruit resembling in some of its forms the fruit of the Red Oak. This tree, which is common in the neighborhood of St. Louis, was well known to Dr. Engelmann, the best-equipped and most experienced man who has made a systematic study of North American Oaks, and it usually appears in his herbarium as Quercus rubra coccinifolia, or as Quercus, n. sp., or as Quercus ambigua. He never published, however, even a varietal name for this tree, but under his remarks on Quercus rubra (*Trans. St. Louis Acad.*, iii., 394) speaks of a form of that species which he considered one of the most variable of our eastern Oaks, with "leaves similar to those of coccinea, with divaricate pinnatifid lobes, or with leaves smaller and more deeply divided, with fewer lobes, much like those of palustris; and acorns always smaller than in the typical rubra, and the cup rather deeper." The description is a good one, but he did not realize how widely this peculiar form was distributed, and he had never had the opportunity to see alive the Texas Red Oak, which at one time he referred to Quercus palustris, and later considered a variety of the Red Oak of the north.

The first description of the Texas Oak appears in Torrey's *Botany of the Mexican Boundary Survey* (page 206), published in 1859, where it is described as Quercus coccinea, var. (?) microcarpa, from specimens gathered by Dr. J. M. Bigelow in rocky ravines near the mouth of the Pecos and on the Limpio, in western Texas. It had been collected about the same time by Charles Wright in south-western Texas and at New Braunfels by Ferdinand Lindheimer, whose specimens are preserved in the Engelmann herbarium; and in the second volume of the *Pacific Railroad Reports*, published in 1852, it had been called Quercus palustris by Torrey and Gray, who certainly could never have seen the fruit. In Hall's Plantæ Texanæ it was named and distributed as Quercus palustris, and as Quercus palustris it appears in Coulter's *Manual of the Flora of Western Texas* (*Contrib. U. S. Nat. Herb.*), published in 1894. Mr. S. B. Buckley, through his long residence in Austin, had excellent opportunities to study in situ the Texas flora, and in 1860 described this tree in the *Proceedings of the Philadelphia Academy* as Quercus Texana, and twenty years later, in the same publication, referred it to Quercus rubra as var. Texana, the name finally adopted by Dr. Engelmann.

Fifteen years ago I first saw the Texas Oak growing on the banks of the Colorado River, near Austin, and at different times I have seen it in other parts of the state, and long ago felt sure that it could not be considered a form of our northern Red Oak. During the past summer I had the good fortune to pass a day with Dr. Schneck, at Mount Carmel, Illinois, at the junction of the White and Wabash rivers, one of the richest and most interesting tree regions in North America, and it at once occurred to me that the Swamp Red Oak of that country was identical with Buckley's Quercus Texana. In company with Mr. Letterman I saw the same tree a few days later upon the banks of the Maramec River, in Missouri, and afterward revisited Austin to refresh my memory of the Texas tree. These field observations and the subsequent examination of most of the Oak material in American herbaria have confirmed my impression that Engelmann's Quercus rubra coccinifolia and Buckley's Quercus Texana are specifically the same, and that the Texas Oak is one of the commonest and most widely distributed trees of the Mississippi valley.

As it grows in the basin of the lower Ohio River Quercus Texana is a tall and noble tree. Dr. Ridgway, in his *Notes on the Native Trees of the Lower Wabash and White River Valleys in Illinois and Indiana* (*Proc. U. S. Nat. Mus.*, 1882, 80), where this tree is referred to Quercus coccinea, which does not, however, reach southern Illinois, speaks of it as the tallest Oak of the region, and records the measurement of a tree which had a total height of one hundred and eighty-one feet, with a clean trunk ninety-four feet tall and twenty feet three inches in circumference. The bark, although rather darker, resembles that of the Red Oak; the winter-buds are those of the Red Oak, and the leaves are hardly to be distinguished in outline, texture and in the lustrous green of the upper surface, from those of Quercus coccinea, but on the lower surface are furnished, like those of Quercus palustris, with tufts of ferrugineous hairs in the axils of the primary veins; in the autumn they retain their green color later than those of other Oaks in the same region, and do not assume the brilliant colors which late in the season make Quercus palustris and Quercus coccinea so conspicuous. In shape the acorns resemble those of Quercus rubra, although they are generally rather shorter and narrower, and the cup, instead of being broad and shallow, is more or less turbinate, and its scales are rather looser and are covered with pale pubescence. Acorns which I gathered near Austin last September were quite pubescent and very distinctly striped, a peculiarity I have not seen on acorns of this tree gathered elsewhere. This striping on the acorns of Oaks is not, however, a specific character that can be relied on, and in other species the acorns are sometimes striped on certain individuals and are not striped on others.

As I know it, Quercus Texana is common in the neighborhood of St. Paul and Minneapolis, Minnesota. It occurs at Waterloo, Iowa, in the neighborhood of Rockford, Illinois, in southern Illinois and Indiana, and near Nashville, Tennessee; it is common from the neighborhood of St. Louis, through Missouri, Arkansas and Texas; it was collected by Hale in Louisiana, probably in the neighborhood of Shreveport, on the Red River, and large trees, evidently of the original forest, are still standing on bottom-lands in Carrollton, near New Orleans, where it is often planted as a shade-tree in the streets. It appears to be the Red Oak of Mississippi and Alabama, ranging as far east as Aspalaga, in Florida, where it has been collected by Mr. A. H. Curtiss.

In the lower Ohio basin, Quercus Texana grows in swamps or on the low and often inundated banks of streams with Quercus palustris, Quercus lyrata, Quercus bicolor, Quercus Michauxii, the Liquidambar, Nyssa sylvatica, Acer rubrum and Populus heterophylla. Any one driving through this region, or even traveling on the railroad, can always distinguish it from the Red Oak by its lustrous foliage, although, without fruit, it cannot be distinguished from Quercus palustris, with which it is often associated. I am told by Dr. Mohr and by Mr. Letterman that it inhabits swamps in southern Missouri and Arkansas and in the eastern Gulf states. Near Austin it grows on the low, moist limestone hills rising above the Colorado River, in company with Quercus Durandii and Juniperus occidentalis, but near San Antonio it grows in low wet bottom-lands.

Of the real value of the wood of this tree little is yet known; probably a considerable part of the so-called red oak of lumbermen is derived from it, and it is certain that all the red oak of the south, which is usually considered more valuable than northern red oak, is from this species.

The Red Oak, Quercus rubra of Linnæus, which is the most boreal of the Oaks of eastern America, probably nowhere reaches the low coast region of the southern states. Very common at the north and always an inhabitant of uplands, where it usually selects rich and well-drained soil, the Red Oak ranges southward along the Alleghany Mountains to northern Georgia, where it is neither common nor of large size, and westward to Minnesota, Nebraska, southern Illinois, central Tennessee, Missouri and central Kansas. Quercus palustris, for which the Texas Oak has so often been mistaken, is also a northern species; it grows in Virginia, a few miles south of Washington, apparently its most southern station in the Atlantic states, and in southern Indiana and

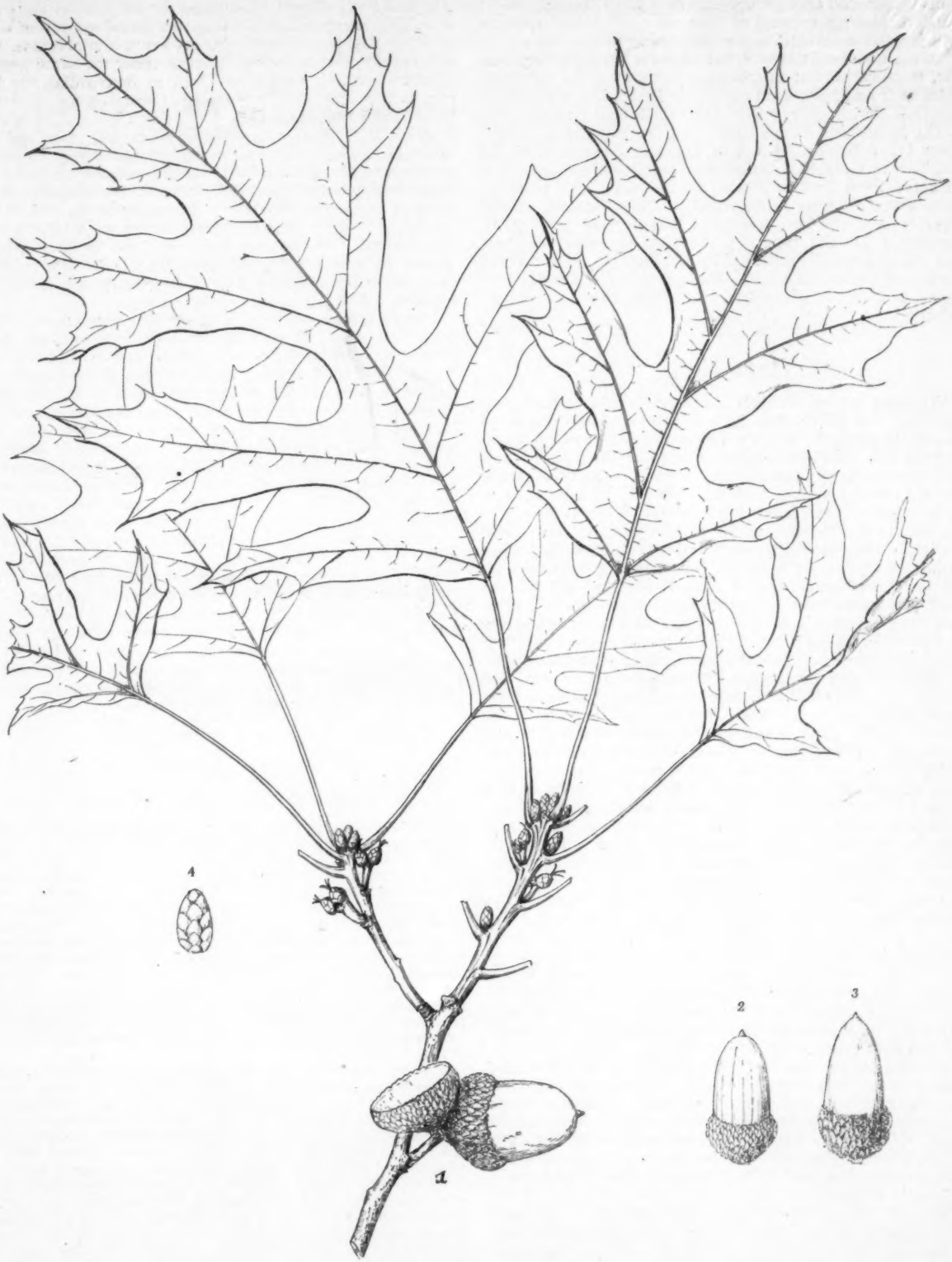

Fig 81.—Quercus Texana.—See page 514.

Illinois, and in central Missouri; but the Tennessee, southern Arkansas and Texas specimens that have been referred to this species, all belong with Quercus Texana.

Of the range, variation and properties of Quercus Texana I am anxious for more information, and these notes and the illustrations which accompany them are published in the hope that botanists living in the western and southern states will give me, this winter, the benefit of their observa-

tions on the Red Oak group, that they may be included in the forthcoming volume of *The Silva of North America*, which will be devoted to the description of our Oaks.

Of the names of this tree, the oldest is Torrey's coccinea, var. microcarpa, but microcarpa, fortunately, is not available, as it had been used earlier by Liebmann for a Mexican Oak, and Buckley's Quercus Texana can be kept up.

The illustration in this issue, on page 515, Fig. 81, represents (1) a fruiting branch of Quercus Texana from the neighborhood of Mount Carmel, Illinois, natural size; (2) an acorn from Austin, Texas, natural size; (3) an acorn from a tree growing in the streets of New Orleans, natural size; (4) a winter-bud, enlarged; that on page 517, Fig. 82, represents (1) the type specimen of Quercus coccinea, var. microcarpa (?), collected by Dr. Bigelow on the Pecos River and preserved in the Herbarium of Columbia College; and (2) a winter-bud from the same specimen, enlarged. *C. S. S.*

Plant Notes.

Viburnum opulus.—This is our native Cranberry-tree, and, although not uncommon in cultivation, should be more frequently planted. It is a strong and quick-growing shrub of good size, flourishing under almost any conditions of soil and surroundings; the foliage is good; the flowers are white, in broad cymes, and are followed in late summer by its bright-colored fruit. In the fruit is the great beauty of the shrub; the berries, when ripe, are a brilliant deep scarlet, having passed through various intermediate stages of reds and yellows; they are borne in large clusters on the tips of the branches, well above the leaves, and keep in good condition until severe frost, after which, although they hang on all winter, they take a duller hue, and are not so attractive. Sometimes they are used for cooking, either as a sauce, as cranberries are prepared, or made into jelly; to many palates the somewhat astringent flavor is not agreeable. The plant is widely distributed over the northern parts of both continents. The common Snowball is a sport from this plant, when the fertile flowers are changed into ray or sterile flowers. There is also a dwarf variety, which makes a compact and symmetrical growth, sometimes effectively used in formal gardening. A form grown at the Arnold Arboretum, from seeds collected among the mountains about Pekin, promises well, the flowers and fruit being larger and finer than the common types. The propagation is by layers, by hard-wood cuttings, or by seeds, which require two years for germination.

Daphne odora.—Before the days of gas and furnaces the Daphne was a favorite house-plant, and the delicious fragrance of its flowers filled many living-rooms from Thanksgiving through the Christmas holidays; now it is rare; in fact, well-grown plants are hard to find. It is a slow-growing greenhouse evergreen shrub, introduced from China into England in 1771; the flowers are white, with purple markings beneath, and borne in clusters; the foliage is a rich dark green of good substance. The cultural requirements are not exacting; it should be grown in a cool house in a rather heavy soil, which, however, should contain plenty of peat and some sharp sand; it should never be overpotted and never be allowed to suffer from lack of water. If carefully handled, it can be planted out in a border, where the growth will be much stronger and the flowers more abundant. The propagation is by hard-wood cuttings in winter.

Cestrum (Habrothamnus) aurantiacum.—This old-fashioned autumn-blooming plant is almost entirely overlooked in the scramble for big Chrysanthemums. A native of Guatemala, it has long been in cultivation, and is very desirable, since it blooms from September to December, when greenhouse flowers are least abundant. The great beauty of the plant is in the large panicles of orange-yellow flowers which bloom in profusion on the tips of the summer's growth; they are somewhat waxy in texture, of fair size and good shape; when used for cut flowers the stems should be short, and more than the usual supply of water given. The plant should be grown in a cool house, and, although it does fairly well in pots under the same general treatment which would be given to Bouvardias, the best results are obtained by planting it out in a well-prepared border, and training it on a wall or as a bush. The growth is quick and sturdy, so plenty of room for roots and top must be given. To insure the characteristic abundant bloom the plant must be cut back severely in June; all weak wood being removed, it must be encouraged to make a good growth during the summer months. The tendency to grow after blooming during the winter should be checked, although no harm is done by this growth unless the June pruning is neglected; this winter growth often promises a second crop of flowers, which is seldom realized. The propagation is by cuttings.

Ipomœa setosa.—This is a good climbing plant for an arbor or piazza. It makes a rapid growth, and the large overlapping leaves form an excellent screen and a dense shade. Mr. W. E. Britton, Horticulturist of the Experiment Station at New Haven, writes that seeds of this Brazilian Morning Glory were sown there about the middle of last May, but only a single plant escaped the attack of cutworms. Before the first of August it had attained sufficient size to make it very attractive. The luxuriant growth, large leaves, and stem covered with bristles, combine to give it a decidedly tropical aspect. The first flower appeared the first of September, and the plant continued to grow and blossom until destroyed by frost about the middle of October. The greatest number of flowers counted at any time was forty. In shape the flower resembles that of the common Morning Glory, and is of a delicate rose-color. The flowers of this individual plant measured two and one-half inches in diameter, and the leaves were six inches across. In its native climate the leaves are said to measure twelve inches across and the blossoms four inches, but it is hardly to be expected that such dimensions can be attained in the northern United States.

Cultural Department.

Some Winter-flowering Plants.

SMALL plants of Pleroma macranthum floribundum, in four-inch pots, are now showing their large flowers in profusion. The type, P. macranthum, flowers most abundantly when it gets to be a large plant, and it likes plenty of root-room either in large pots or planted out in a border. This variety, however, is better suited for pot-culture, and small plants six or eight inches high flower freely. The short branches have oblong-ovate acuminate leaves, and the large brilliant violet-blue flowers are nearly six inches in diameter and produced singly at the ends of the branches. Cuttings taken in spring root easily, and grown on in rich open soil soon make flowering plants. It was introduced from Brazil in 1870, but has not become common yet. The original plant here was received a few years ago from the Botanic Garden, Glasgow, Scotland.

A plant, five feet high and three across, of Toxicophlæa (Acokanthera) spectabilis, or Winter-sweet, has large dense sprays of white corymbous flowers, which are exceptionally fragrant at this time. It is easily grown, an excellent winter-flowering plant, and should be in every collection where odorous white flowers are wanted. The plants are grown here in an intermediate house, and in spring they are potted firmly in good rich soil. In summer they are placed out-of-doors in a sunny position, and early in the fall they are taken back to the greenhouse and placed in a position where they can get plenty of light. Before they begin to bloom, a few waterings with weak liquid-manure is very beneficial to them. Another species, Toxicophlæa Thunbergii, is also grown here, but is not in bloom yet.

Another handsome plant with very fragrant flowers, now in bloom, is Osmanthus fragrans—one plant being sufficient to perfume a whole house. It is a native of Japan and China and was brought into cultivation more than a century ago. Small plants flower very freely; but large plants, from four to six

feet high, can be grown. The shining leaves are elliptic-lanceolate, slightly serrated, and the small, fragrant, almost white flowers are borne thickly on the branches. It is easily cultivated and thrives in a temperature of forty to fifty degrees. Cuttings of the ripened young shoots root with the aid of a little bottom-heat.

Plumbago rosea coccinea is a desirable plant, and at this time is displaying its pleasing flowers. P. rosea, the type, is an old garden-plant, but this excellent variety is a superior plant and was introduced about thirty years ago. It makes a compact plant about three feet high, and the branches are furnished with alternate, oblong, ovate leaves. The bright red flowers are produced in large, loose terminal panicles, which are showy for a long time. Young plants, grown from cuttings taken last spring, make nice flowering plants now. They require to be grown in a warm, moist house and given a position where they can get plenty of light.

The Blue Marguerite, Agathæa cœlestis, is a valuable plant for the flower-garden in summer. When signs of frost appear it can be taken up and potted; it will then make a handsome plant for the greenhouse, where it blooms more or less all winter. It is a low plant, growing about a foot high, and its branches are clothed thickly with small dark green leaves, ovate in shape and rough to the touch. The pretty blue, daisy-like, flower-heads are produced singly on long peduncles. Blue flowers are scarce at this time, and this plant is appreciated on that account. Small shoots root easily at any time; but if rooted early in spring they are more useful for the garden in summer. Although it is so easy to grow, and has been in cultivation a long time, yet it is very seldom seen.

Impatiens Sultani and its varieties are exceptionally easy to grow and are everlasting bloomers. A batch of plants, raised from seed received under the name of Sultani hybrida, are flowering very freely now. The habit and growth of the plants are similar to those of the type; but the flowers are quite distinct. Many of them have very pleasing shades of color.

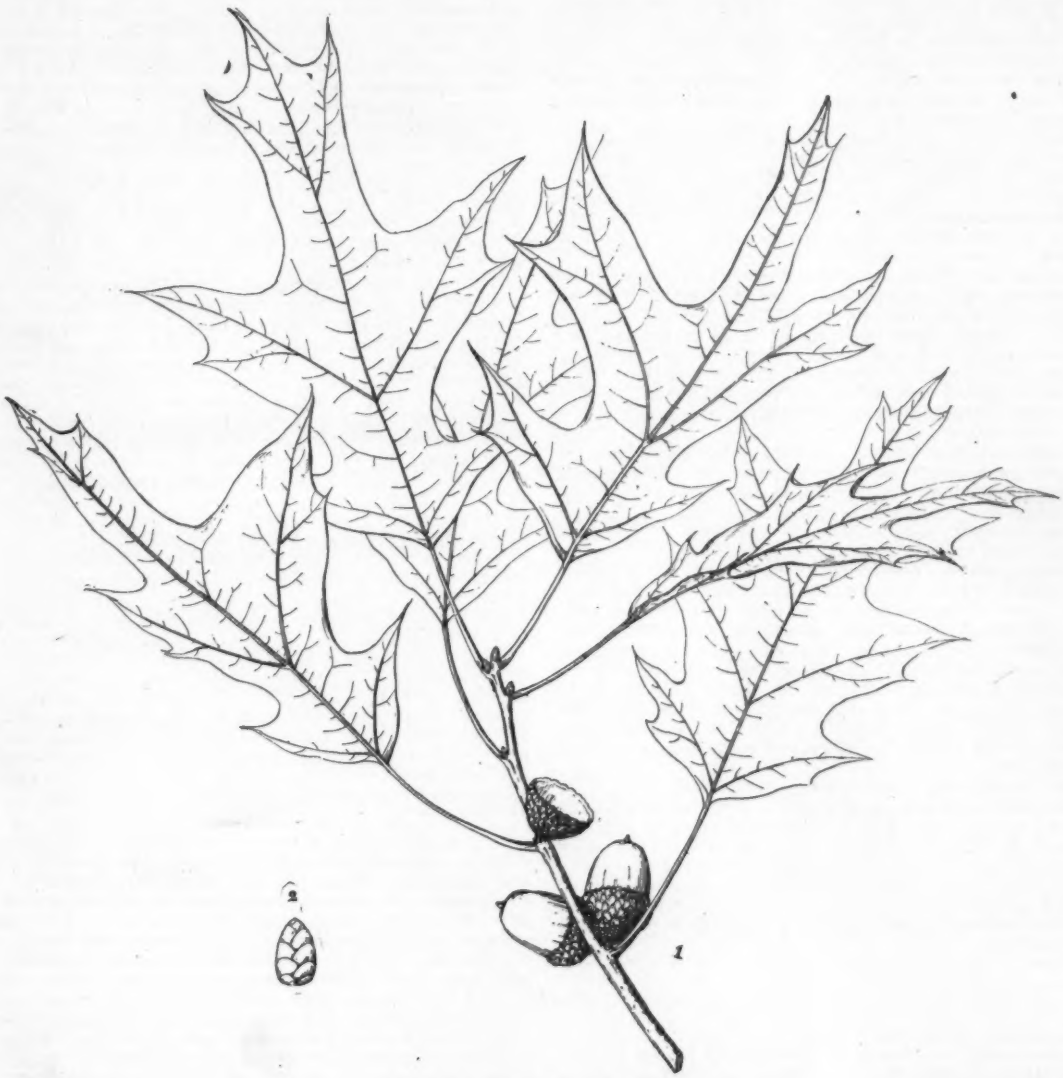

Fig. 82.—Quercus Texana.—See page 514.

Impatiens Hawkeri is a beautiful Balsam which was introduced from the South Sea Islands a few years ago. It is a bushy, soft-wooded plant, well furnished with ovate, acuminate, slightly serrated leaves, which are opposite or whorled, about four inches long and two broad. The very showy deep carmine flowers are borne on long peduncles, and are produced singly from the axils of the leaves. This is an excellent plant, and deserves to be more plentifully grown. It is easily raised from cuttings in spring or summer. The plants rooted in summer give more flowers in winter than those struck early in spring. It thrives best in an intermediate temperature.

Botanic Garden, Harvard University. *Robert Cameron.*

Achimenes.—III.

PATENS VARIABILIS, Patens major, Boeckmani rubida and François Cardinaux are four names, but they apply to a single variety of Achimenes, and that a very good one, strong in growth and producing great numbers of lively rose-purple blossoms. No variety, so far as I know, gives more numerous flowers. Perlata, as I have it, is the same. I procured it from Van Houtte many years ago, but his last catalogue describes it as "ashy." These are all flat-flowered, much like the varieties of A. longiflora. A. grandiflora (*B. M.*, t. 4012, *Bot. Reg.*, xxxi., t. 11, both incorrect in color) is not very different from Patens variabilis, named above; it is, however, distinct enough to be worth growing. It is bright rose, without any trace of purple. The Kleei of *Paxton's Magazine* gives the color of A. grandiflora perfectly. "Ghiesbreghti" is simply a synonym; Stella and Chelsoni are indistinguishable from it. Carl Wolfarth is a violet-shaded variety of it, and so is Louis van Houtte. Carl Wolfarth is the better of the two. A. grandiflora flore pleno is what its name denotes; a more ragged, untidy, disagreeable flower would be hard to find.

Masterpiece is one of the very best varieties in every respect. Its somewhat trumpet-shaped flowers are bright rosy violet, with a pure white throat. They are produced in great numbers, and contrast beautifully with the vigorous bronze foliage. Admiration is the same thing exactly. Perhaps two growers produced this variety, and each was unwilling to discard so fine a kind.

Achimenes Georgeana (a true species) and its varieties Splendens, Gigantea, Fulgens, Discolor and Leopard are six names for five kinds, but all, though distinguishable from each other, so much alike that one of them is enough, and that one should be Fulgens, which is the same as Discolor, a strong-growing erect kind with bronze foliage and large trumpet-shaped flowers of rich velvety carmine, shaded with orange in the centre. Some dealers sell these varieties as Ghiesbreghti.

There are many small-flowered kinds which should not be passed over on account of their size, for their brilliancy or beauty of a quieter kind makes them as desirable as the larger ones. Dazzle is a well-known and favorite sort, and usually makes one of every group entered at exhibitions. Its flowers are bright, clear vermilion, about half an inch in diameter; its foliage dark green. Treviriana, Coccinea (figured in *Botanical Magazine*, t. 374, as Cyrilla pulchella), Splendens, Pygmæa, Diadem, Feuer König, Frau K. Schmidt, Harry Williams, Ingrami and Rouge feu doré are all so much like Dazzle that few persons who have one of them will care for any of the others, unless it be Frau Schmidt, whose scarlet is of a decidedly darker shade than that of the others. Of the same general appearance as this group, but of a different color, are Treviriana rosea, T. rosea magnifica and Gem, all desirable. Gem has a salmon tinge; the others are sufficiently described by their names.

I am well aware that descriptions of varieties, if too long, are not exhilarating reading, and I fear that readers are tired of Achimenes by this time; but I began these papers with the ambitious design of providing a résumé of most of the varieties obtainable, and if my purchase of every sort I could find mentioned was an exemplification of the speedy sundering of the unwise person and his money, this record may prevent others from indiscriminate collecting. Another paper will finish the account.

Canton, Mass. *W. E. Endicott.*

The Care of House Plants.

IN connection with an address delivered by Mr. Robert Craig, in Philadelphia, last week, on "Plants for Home Adornment, and How to Take Care of Them," a plant of Areca lutescens was exhibited, which has been growing in the dining-room of Mrs. John Burton for rather more than four years. This plant was picked up from the rubbish pile, where it had been thrown as worthless, because it had shown evidences of going to flower, as is sometimes the habit of this Palm, and to practical florists it is rather too slow in outgrowing the check which flowering produces. The plant is now a neat specimen some four feet high and as many in diameter; the largest leaf from where it leaves the main stem is three feet and a half long, and it has some twenty leaves now, large and small. In the summer-time it has heretofore been placed under a Grape-arbor, and some of the lower leaves show evidences of damage from the cutting winds and driving storms which we frequently get in this latitude during the summer season. The plant has received more or less water at the roots every day, and this I consider the secret of successful plant-culture in dwelling-houses. Of course, in city residences there may be some unconsumed illuminating gas which escapes, to the detriment of plant-life, and there may be gases from the heating furnaces, which sometimes do serious damage. I am also inclined to believe that these gases receive more blame than the facts justify, and I am satisfied that the greatest trouble in the cultivation of plants in dwelling-houses is insufficient water at the roots. The serious damage is often done the first week or two after plants leave the grower. In a glass house there is considerable moisture in the atmosphere continuously, whereas in a dwelling-house the atmosphere is generally quite dry, and as a consequence there is much more evaporation from the foliage of a plant under these circumstances than there is in a greenhouse. I regret to say that florists are largely responsible for this state of affairs, because, as a rule, in a greenhouse the instructions are generally to be careful and not to give too much water to plants, and florists too often give this advice to their patrons when buying plants for use for home adornment, without taking into consideration the differences in environment. It ought to be added that Mrs. Burton's dining-room has been heated by a hot-air furnace, which furnishes conditions of dryness in the air generally considered fatal to plants.

Another thing which must be borne in mind is the temperature of the living-room, which is generally from sixty-five to seventy degrees. If the plant should occupy a position where the temperature is lower than this, less water of course will be required.

I know of another Areca which has been in a sitting-room in Chestnut Hill for three years, and it certainly is the picture of health. This receives water daily, because the temperature rarely falls below seventy degrees. An Adiantum Farleyense has been, to my knowledge, in the residence of Edwin Lonsdale since Thanksgiving Day, and it is now none the worse for the change from a warm moist greenhouse to a warm dry living-room. I also know of a Pandanus utilis which has been three years in the dining-room of Mr. John N. May, of Summit, New Jersey, and a more beautiful plant cannot be imagined. Every leaf is a dark glossy green, and perfect to the very tips. After breakfast every morning all the water that may remain in the glasses is poured carefully upon the soil over the roots of this plant. This is again done at noon, and once a week it is taken out for a thorough soaking with water at the roots, and allowed to remain there until the superfluous water has drained away. Windmoor, Chestnut Hill and the second Areca lutescens referred to, and the Adiantum Farleyense are in my own home.

I wish to add that in none of these cases cited do the men of the household, although practical plantsmen, have anything to do with the care of the plants. A little advice may have been given in their early experience, but any counsel now offered is scorned by the good ladies of the house, who feel competent to attend to the needs of their pet plants. I have no doubt that any intelligent woman who puts her mind to it can make Palms and Ferns flourish in ordinary living-rooms.

Philadelphia, Pa. *L.*

Subirrigation.—The value of subirrigation in greenhouse work is unquestioned, and it is there a perfectly practicable and feasible operation. In field-work, however, it is not so easily managed. Several years ago an experiment to determine its efficacy was started at this station. Two plots of ground, each containing four square rods, were trenched with ditches one foot deep and three feet eight inches apart. In one plot iron pipes half an inch in diameter, punctured with holes a quarter of an inch in diameter and one foot apart, were laid in these ditches. In the other plot four-inch drain tiles were laid in the same way as for underdraining. These were covered with straw before the soil was filled in. Each line of pipes was connected with a supply-pipe running along the end. This supply-pipe is in turn connected with a hundred-barrel tank, raised about ten feet above the ground. This was first put in operation in the spring of 1888, but has stood idle much of the time since. The past season it was again tried, and while the results were unquestionably in favor of the irrigated plots, when compared with those not irrigated, they were still not so marked as might have been hoped for. The difference became more apparent as the season progressed and the dry weather continued. Undoubtedly many of the pipes have become filled up, more or less, so that the water is not so evenly distributed as formerly. From fifty to one hundred barrels of water were used at each application. It will be readily seen, therefore, that the amount of water required is very considerable. Another inconvenience arises from the fact that a wooden tank like this soon dries out, so that much

water is wasted in soaking it up again, unless it is kept full all the time. This difficulty might be obviated by making a cement reservoir in the ground, however. One of the special advantages noted in favor of the irrigated plots, in the growth of tomatoes, was the decreased amount of dry-rot found on those plots. Why there should be less of this than on unirrigated land seems hard to say, but such was the fact. The plants were also much more healthy and vigorous and the fruits larger and better. Taken as a whole, however, the results do not seem to be such as to warrant the outlay required, except in very special cases where an abundance of moisture is a prime requisite, and the returns very large in proportion to the amount of land required.

Lincoln, Neb. *Fred W. Card.*

Correspondence.

Chrysanthemums Naturally Grown.

To the Editor of GARDEN AND FOREST:

Sir,—If any readers of GARDEN AND FOREST besides your correspondent R. P., on page 498, have confused notions of what is meant by the phrase "naturally grown Chrysanthemums," I may be allowed to say, since my name has been referred to in the matter, that it does not mean plants stopped so that the flowers will all be on a dead level or trained into a perfect globe over which flowers of the same size are distributed at exactly equal distances, nor, on the other hand, does the phrase mean that the plants should be left to grow as they please. All cultivated plants require cultivation. Most varieties of Chrysanthemums should be judiciously disbudded, but the plants should be allowed to assume a graceful rather than a geometrical form. The flowers should appear at varying heights, and no effort should be made to have them all of exactly the same size.

Cultural skill is required to raise good Chrysanthemums in this way, as well as it is to grow any other flower, but people go to exhibitions to see flowers, and not to wonder at cultural skill and nothing else. They like beauty of form as well as of color; they like plants of graceful outline better than those constrained into unnatural shapes, even though it takes great cultural skill to constrain them.

When on the subject of exhibitions I may add that these too often consist of great masses of colors produced by large numbers of enormous flowers. There may be a hundred different varieties on exhibition, but the main display usually includes less than half that number, generally of the newer kinds—the same flowers in endless combination and assortment. Now, there are thousands of varieties of widely different types, and one who has seen the regulation Chrysanthemum show, with its meagre offering in the way of variety, feels little desire to make a second visit. To make these shows successful they ought to broaden out so that we can see other Chrysanthemums than the few kinds which interest the professional grower in a particular season.

I am not very familiar with the hyperborean climate of Boston, but R. P. need not feel any commiseration over Chrysanthemums shivering in this latitude on a frosty morning. I have proved, year after year, that great satisfaction can be found in outdoor Chrysanthemums. When the right kinds are grown properly they enjoy a little frost as much as a man does, and are by no means inclined to wilt under it. My first note to GARDEN AND FOREST, in its first year, was on open-air Chrysanthemums, and I have no reason to change the views then expressed. It may be difficult to retain the lower foliage of plants in the open, though the stems will be sufficiently clothed, nor will there be any difficulty in securing flowers large enough to be beautiful, although they may lack depth since chilling weather while the flowers are expanding may make it necessary to keep them rather dry. This depth of flower is secured readily in plants grown under glass, but it is usually at the expense of other desirable qualities. Skilled growers produce in an incredibly short time flowers which are marvels of size and apparently of fine substance. But the truth is, that many of these flowers are not worth the labor expended on them because they have no lasting quality. Fugacious flowers are often worth much care in cultivation, but Chrysanthemums ought to be durable. When properly grown and cut, when perfect, they should last in an ordinary living-room for a fortnight or longer. Average greenhouse flowers do not last over two days at a show, and there would be few prizes to distribute if the flowers were judged at the end, instead of the beginning, of the exhibition. Of course, there are good growers who produce firm flowers, but I observed that most of the flowers carried away from an exhibition which I recently attended were carefully wrapped in paper to protect them from the wind. The friends who used to carry away my flowers grown out-of-doors never needed to take these precautions, nor did they distribute the petals of the flowers along the wayside.

Many of us are not able to have all the glass houses we want. When we cannot have greenhouse room for our Chrysanthemums we must try to make the culture of them in the open air enjoyable. Certainly it is possible to do this, and I really know no plant which at so little expense will give better results with intelligent cultivation, although to afford the occasional protection needed may tax one's ingenuity and energy to the utmost. Of course, open-air cultivation of Chrysanthemums, where flowers are grown for profit, is wasteful, for there always comes a night in late November when the glory is sure to vanish. By this time, however, the amateur will be surfeited, and will privately bless the frost.

Elizabeth, N. J. *J. N. Gerard.*

Planting Trees for Autumn Color.

To the Editor of GARDEN AND FOREST:

Sir,—I wish to say a word of approval for the suggestion in your issue of November 28th, that nurserymen should propagate trees which show the brightest colors. This practice, if adopted, would be of great value to those who live in severe climates where the Liquidambar, the Japan Maples and other trees which turn to most attractive colors in the fall, do not thrive. If a person who desired to set out an avenue of Maples, for example, could obtain from a nurseryman trees in which an average of ten per cent. would produce fine autumn coloring, this would be a great advantage. I have in mind an individual Hard Maple-tree that is not only extremely brilliant in its coloring, but it is actually the first tree in its neighborhood to turn—that is, one side of it turns brilliantly while the other remains green. Its early color may be accounted for by the fact that it stands on the dry side of a ravine where it may ripen earlier than its neighbors. But why one side should turn and the other should not seems to prove that the peculiar power to change to brilliant colors is inherent in the leaf-buds and might be perpetuated. I hope to plant some Hard Maples as street-trees next spring, and I would pay a liberal premium on each tree if I were sure that I could obtain specimens which would color well.

Chicago. *W. C. Egan.*

Recent Publications.

Lehrbuch der Botanik für Hochschulen. Von Dr. Ed. Strasburger, Dr. Fritz Noll, Dr. Heinrich Schenck und Dr. A. F. W. Schimper. Jena, Gustav Fischer. Pp. 558, 8vo, fig. 577.

The names of the authors would lead one to expect a work of unusual importance for teachers and students. The expectation is fully confirmed by an examination of the book, which has just appeared. It is intended for "Hochschulen," but that term, it should not be forgotten, is not to be translated literally by our words "High Schools," which are something different. The Germans, in speaking of their high schools, refer to the universities, not to the gymnasia, which correspond to a great extent to our high schools. In the present treatise we have a very valuable general presentation of all divisions of botany, which will be of the greatest service to all teachers, and to the students in our universities and technical schools. The chapter on general morphology are by Strasburger; those on physiology by Noll; those on Cryptogams by Schenck, and those on Phanerogams by Schimper. These are all recognized masters in their respective fields, and it is safe to say that, since the appearance of the different editions of Sachs' *Lehrbuch*, no general treatise on botany has appeared in which the subject has been so thoroughly and comprehensively treated as in the present work. A comparison with Sachs' *Lehrbuch* will show how great has been the advance in botany in recent years. The book presents a very attractive appearance; the text is well printed, there is a full index, and the figures are excellently drawn. In some of the figures of Phanerogams colors have been used with excellent results, and one is surprised that such results can be obtained at a cost which makes it possible to insert them in a textbook which must necessarily be offered for sale at a comparatively low price.

Notes.

Neat little plants of the Japanese Kumquat are becoming popular for holiday decoration. They are quite as handsome as the Otaheite Orange, but the fruit is so palatable that it is not likely to remain so long on the plant.

Mr. Robert Douglas writes that Black Walnut-trees, when set thinly in a plantation of Catalpa speciosa, made as rapid upward growth as the Catalpas until they reached a height of thirty feet, while in a small block planted of Black Walnut exclusively the trees at the same age were not twenty feet high.

The annual meeting of the American Forestry Association will be held at the Department of Agriculture, in the city of Washington, on Friday, the 28th of December. In the evening, Professor N. S. Shaler, of Harvard University, will deliver an address on the Economic Aspect of Erosion before a joint meeting of the Forestry Association and the National Geographical Society.

The Baldwin is the great commercial apple grown in southern New England, with the Rhode Island Greening and Northern Spy following at a considerable distance. In some parts of Maine, however, especially near the banks of the rivers, the Yellow Bellflower, according to the *Vermont Farmers' Advocate*, is a great success. The fruit from a Bellflower orchard at South Gardiner, Maine, rarely brings less than five dollars a barrel for the first quality, which is scarcely less than prices for extra Newtown Pippins. Large, highly colored Baldwins from the same region bring much smaller prices.

The so-called Apple-scab is one of the serious pests of American orchards, not only because it causes misshapen and undeveloped fruit, but because the affected trees suffer from defective foliage. When it is remembered that the fruit-buds of one year are all started the year before, the necessity for healthy foliage every year is apparent, and it is plain that the fungus should be kept from trees on the off years as well as on the bearing years. We have often given accounts of the effectiveness of the Bordeaux mixture against this disease, but it is a matter which every one ought to understand. Some late experiments made at the Agricultural College of Missouri seem to show that the weaker solutions were about as effective as the stronger ones, and that the first spraying should be given very early, and be followed by at least three others. The second crop of scab, which appears on late apples, like the Jennetings, seems in this case to have been entirely prevented by spraying.

A late bulletin of the Alabama Experiment Station reports some results obtained by Professor E. H. Mell, in crossing different varieties of Cotton for the purpose of improving the fibre. His investigations have convinced him that the different varieties of cotton now cultivated have been developed by intercrossing some seven species of the genus Gossypium. These species have been blended so that the distinctive characters of each have been so concealed in the different kinds of upland Cotton that it is almost impossible to trace them. The experiments show that crossing varieties in nearly every case improved the condition of the fibre, and in some individual instances remarkably so. The good properties aimed at are complete maturity throughout the length of the fibre, uniform twist from end to end, uniform width in all its parts, maximum length and purity of color. A cross between the varieties Barnet and Peerless showed a great increase in the number and weight of the seeds, as well as in the weight of the fibre, and other good qualities. These experiments are interesting, not so much for what they have directly accomplished in producing improved strains of cotton, but in pointing out what can be hoped for by a course of judicious and persevering cross-fertilization.

Mr. R. A. Rolf writes in the last number of the *Orchid Review* that a curious Catasetum has lately appeared in four or five different collections in England, which has the general appearance of a yellow C. macrocarpum, but with a much more expanded lip. In one or two instances the plants had been purchased as C. Bungerothii, but one of these plants which flowered with Messrs. Hugh Low & Co., presented certain features which led to the suspicion that it was a natural hybrid between that species and C. macrocarpum. Soon after a remarkable group was exhibited by Messrs. Linden, of Brussels, including a series of curiously intermediate forms which are evidently natural hybrids between the two species named, which occur in the same district. These plants were exhibited under different names, but all of them seem to have originated in the same way, and thus they may be considered as varieties of one hybrid for which the name of C. splendens is retained. These forms, together, represent almost a complete transition series between two common, but very distinct species, among which they are found growing, and the peculiar way in which the characters are combined, some of the varieties approaching one species and some the other, while the remainder present combinations of the two, compels the conclusion that they must have arisen by intercrossing through insect agency.

During the holiday season one can hardly find a more beautiful or fragrant spot in this city than the stores where the choicest and rarest fruits are sold. Many of these fruits are not only singularly attractive, but they are most skillfully and tastefully grouped. Among the oddities are Indian figs, which are offered at fifty cents a dozen, and very attractive they are in appearance. They are really prickly pears from the West Indies, and although they may sell more readily under their trade name, they are no more grateful to the palate. Spanish pomegranates are worth fifty cents a dozen, the best Florida grape-fruit a dollar and a half a dozen, and Tangerine oranges, two or three attached to a leafy branch a foot long, look very attractive, and sell for $1.50 a dozen. Imported Gros Colman grapes are worth $2.50 a pound, the same variety from American glass houses costing two dollars. A few peaches from California which have lingered along in cold storage are offered for twenty-five cents each, but are worth nothing except to look at. Good Almeria grapes are expensive, but fair Catawbas can be had for twenty-five cents for a five-pound basket. Selected apples and pears command almost any price, according to the perfection of their form and the texture and complexion of their skin. Some of the Lady-apples and Forelle pears are almost too handsome to eat, and fine Easter Beurre pears bring three dollars a dozen.

The brisk sales of Christmas greens during the past fortnight were in marked contrast with this trade a year ago, and roping, which then was unsalable at the losing wholesale price of one cent a yard, was this season quickly bought up at five times that price. Standing Pine or Ground Pine was scarce, owing, it is said, to heavy snows in New Hampshire and Maine, and Hemlock, Spruce and Kalmia were largely used to take its place. The steamer Magenta, from Keyport, has daily brought a full cargo of roping and made pieces, such as wreaths, horseshoes, stars and hearts, and in even larger quantity branches and tree-tops of holly, profusely berried. The holly, packed in small bunches, larger bundles and bales and in barrels and boxes, was in greatest demand, and was altogether most showy and beautiful, the berries being unusually large and thickly set, and the foliage particularly green and glossy. This rich and brilliant natural coloring made dyeing unnecessary, and the artificial greens and crimsons of former years were almost unseen. Pipsissewa, boxwood, lichens, life-everlasting and bitter-sweet berries entered into the designs, which were in very large supply, and brought, comparatively, the lowest prices, holly wreaths selling from twenty to seventy-five cents a dozen at wholesale. Some mistletoe is brought here from the southern states, but the greater portion is imported from France.

The report of the Valley Forge Commission for 1894 contains a map on which is indicated certain ground which it is recommended to add to the park, amounting in all to some two hundred and fifty acres, and among other things to provide for a broad avenue along the outer line of the camp, where nine of the fourteen brigades, that wintered in Valley Forge, were stationed. This avenue would not only mark out the line of the camp, but afford an opportunity for the colonial states to mark the camps of their respective troops. Since the law under which this was made the property of the state requires that the fortifications and their surroundings should be maintained as nearly as possible in their original condition as a military camp, the report recommends the laying out of paths and roads in such a way as to make the retrenchments and redoubts accessible. The commissioners believe that with the boundaries enlarged there will be little difficulty in securing the interest and attention of the states through their several constituted authorities to this historical spot, and that the nation will erect on the summit of Mount Joy, which is within the second line of entrenchments, a high battlemented tower surmounted by a bronze figure of a private soldier of the Revolutionary army. From the summit of such a tower the whole camp-ground and its surroundings could be seen, and it would be a landmark visible from any direction several miles away.